

R E M A R K S

1. Specification

The specification has been amended to remove the references to the English language equivalents to the Finnish-language documents cited in Applicants' Information Disclosure Statement filed on June 16, 2000. Page 4 of the Specification has also been amended to include the relevant information from claim 1 and page 5 of the Specification has been amended to include the subject matter contained in claim 41. No new matter has been added.

2. Claims

A. Claim Objections

The Examiner has objected to a number of the claims for being improper multiple dependent claims or for containing misspellings. Claim 8 has been amended to remove the language "haul-off". Claims 27 and 40 have been amended to correct misspellings. And, claim 32 has been amended to correct an improper multiple dependency. It is believed the above-described claim amendments have obviated the objections. Reconsideration and removal of the objections is respectfully requested.

B. Claim Rejections

The Examiner has rejected claims 8-41 under 35 USC §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended the

claims to address the issues raised by the Examiner. Specifically, Applicant has amended claims 8-10 to substitute "which catalyzes" in place of the phrase "capable of catalyzing". Applicant has also removed the objectionable phrases "such as" and "for example" from claims 15 and 39 and has introduced new dependent claims containing the subject matter removed from claims 15 and 39. Applicant has amended claim 33 to depend from claim 32 and has amended claim 31 to recite "an overhead stream" instead of "the overhead stream".

The Examiner had rejected claim 22 because the Examiner could not determine what was meant by the last step. Applicant believes that the Specification adequately describes this step (i.e. separating the two components from one another) on page 13, lines 1-10, page 16, lines 11-16 and page 15, lines 10-13. Applicant has, therefore, not amended the claim language. The Examiner had also rejected claims 11, 13 and 39 for the use of the term "Me" which had not been defined. Applicant would like to direct the Examiner's attention to page 10, line 23 (formula) and lines 29-20 where it is clear that Me stands for methyl group (see also, page 6, line 18 and page 21, lines 25-26 and 29). Claim 8 has been amended to remove the language "exhibiting melt-strength of at least 2.5g, determined by the hand-off" to obviate the Examiner's rejection to the use of the melt-strength terminology.

Applicant believes that the foregoing amendments have obviated the rejections. Reconsideration and removal of the rejections is requested.

3. Rejections Under 35 USC §102

The Examiner has rejected claims 8, 9, 11-13, 17, 18, 22, 23, 25, 28, 29, 32 and 39 under 35 USC §102(b) as being anticipated by Cecchin et al. (EP 573862). Applicant has amended claim 8 to distinguish over the Cecchin reference. Cecchin discloses a multistage process for producing a propylene composition. Example 1 of Cecchin describes a multistage process where the actual polymerization is carried out in a gas phase. Example 4 of Cecchin describes the preparation of fractions A and B in the same autoclave (not in a series of reactors). This reference does not disclose the use of at least one loop reactor as required by claim 8 as currently amended. Reconsideration and removal of the rejection is requested.

4. Rejections Under 35 USC §103(a)

The Examiner has rejected claims 21 and 33 under 35 USC §103(a) as being unpatentable over Cecchin. Claims 21 and 33 ultimately depend from claim 8. As noted above, the present invention uses a plurality of reactors (gas phase or loop) wherein at least one reactor is a loop reactor. This configuration is not disclosed in Cecchin. Although Cecchin may teach the use of ethylene as a comonomer, Applicant submits that the use of ethylene as a comonomer in the configuration of the present invention is not disclosed or suggested. Reconsideration and removal of the rejection is requested.

The Examiner has also rejected claims 10, 19, 20, 24, 26, 27, 30, 31, 35 and 36 under 35 USC §103(a) as unpatentable over

Cecchin in view of Korhonen et al. (FI 961152). The Examiner argues that Cecchin discloses a multi-reactor system comprising liquid phase reactors, gas phase reactors or both liquid and gas phase reactors. Cecchin does not disclose the use of loop reactors. The Examiner therefore cites to Korhonen for the use of a loop reactor as first stage and the use of flash tanks, overhead stream and recycle. Applicant submits that a person skilled in the art would not be motivated to combine the teachings of Cecchin with those of Korhonen to arrive at the instant invention.

The disclosure of Cecchin has been discussed above. Korhonen teaches the use of a prepolymerization reactor having a special structure in a polymerization system. According to Korhonen, the problems relating to the even residence time of the catalyst can be avoided by using the special prepolymerization reactor. The reactors followed by the prepolymerization reactor (CCSTR) can be any type of reactor used in the field. Loop and gas phase reactors are mentioned as useful reactor types. It should be emphasized that the polymers obtained by the process of the present invention have a strongly bimodal nature as demonstrated by the different MFR values from each stage. A person skilled in the art would not be motivated to combine the teachings of the Cecchin reference with the Korhonen reference to arrive at the present invention because (1) Korhonen reference only describes the results obtained by using CCSTR; (2) Korhonen does not teach or disclose that it would be possible to obtain polypropylene compositions having a strongly bimodal nature through its process and (3) none of the examples in the Korhonen reference describe a multistage polymerization process. As such, Applicant submits that the

Examiner has not demonstrated that a person skilled in the art would be motivated to combine the teachings of these two references and therefore has not established a *prima facie* case of obviousness. Reconsideration and removal of the rejection is requested

Favorable action and early allowance of all the claims are earnestly solicited.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

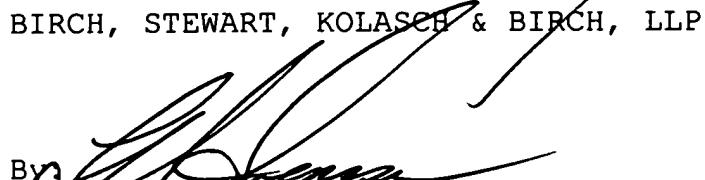
Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a two (2) month extension of time for filing a response in connection with the present application and the required fee of \$440.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By

  
Leonard R. Svensson  
Registration No. 30, 330

P.O. Box 747  
Falls Church, VA 22040-0747  
(714) 708-8555

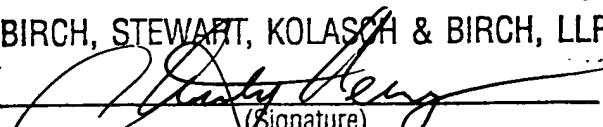
LRS/KR/clh

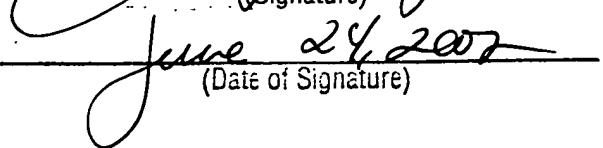
Attachment: Version with Markings to Show Changes Made

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope to: Commissioner of Patents and Trademarks, Washington

D.C. 20231 on: 6-24-02  
(Date of deposit)

BIRCH, STEWART, KOLASCH & BIRCH, LLP

  
(Signature)

  
June 24, 2002  
(Date of Signature)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning on page 4, line 20, has been amended as follows:

"More specifically, the linear polypropylene homopolymer or copolymer according to the invention [ is characterized by what is stated in the characterizing part of claim 1] exhibits a melt strength of at least 2.5g, determined by the haul-off method, and comprises a high molar mass portion and a low or medium molar mass portion, the high molar mass portion having a Melt Flow Rate (MFR<sub>2</sub>) of less than 0.1g/10 min and the low or medium molar mass portion having a Melt Flow Rate (MFR<sub>2</sub>) of more than 0.5/10 min. The polymer has a Melt Flow Rate (MFR<sub>2</sub>) of 0.1 to 20g/10 min.

The paragraph beginning on page 8, line 34, has been amended as follows:

Examples of suitable catalyst systems are described in, for example, Finnish Patent Nos. 86866, 96615 and 88047 and 88048 [US 5,234,879, EP 0 627 449 and WO 92/19653, WO 92/19658 and WO 92/19659].

The paragraph beginning on page 8, line 36, has been amended as follows:

One particularly preferable catalyst, which can be used in

the present invention, is disclosed in FI Patent No. 88047 [WO 92/19653]. Another preferred catalyst is disclosed in Finnish Patent Application No. 963707 [WO 98/12234].

The paragraph beginning on page 11, line 32, has been amended as follows:

The catalyst can be prepolymerized prior to feeding into the polymerization reactor. During prepolymerization the catalyst components are contacted for a short period with a monomer, such as an olefin monomer, before feeding into the reactor. Examples of suitable systems are described in, e.g., Finnish Patent Application No. 961152. It is also possible, as described in Finnish Patent No. 95387 [EP 0 607 703], to carry out the prepolymerization in the presence of a viscous substance, such as an olefinic wax or an oil/wax mixture, to provide a prepolymerized catalyst which is stable during storage and handling. The catalysts prepolymerized in wax will also allow for easy dosing of the catalyst into the polymerization reactors.

The paragraph beginning on page 21, line 24, has been amended as follows:

The polymerizations were carried out in the presence of a Ziegler-Natta catalyst with an external electron donor corresponding to the general formula I and V above (dicyclopentyl dimethoxy silane, in the following abbreviated "D"). The catalyst was prepared according to the method described in FI Patent No. 88047 [WO 92/19653]. A polymer prepared in the presence of a corresponding catalyst system containing a conventional donor corresponding to the general formula IV (cyclohexyl methyl

dimethoxy silane or abbreviated "C") was tested. As a reference, a commercial polypropylene was used. Polymerizations were made in liquid propylene where the first polymerization step was made without any hydrogen in the feed and the second step in the presence of hydrogen.

The paragraph beginning on page 23, line 16, has been amended as follows:

A prepolymerized  $MgCl_2$  supported Ti-catalyst (prepared according to FI Patent No. 88047 [WO 92/19653]) was used in the polymerization. The cocatalyst was triethyl aluminium (TEA) and dicyclopentyl dimethoxy silane (DCPDMS) was used as an external donor. The Al/Ti mole ratio was 150 and Al/donor mole ratio 5.

Please add the following paragraph on page 5, line 7 of the Specification:

--The product prepared by the process according to the invention can be nucleated for higher crystallization temperature, stiffness and optical properties.--

IN THE CLAIMS:

Please cancel claims 18 and 19 without prejudice or disclaimer of the subject matter contained therein.

Please amend the claims as follows:

8. (Twice Amended) A process for preparing linear high melt strength propylene homopolymers and copolymers, [exhibiting a

melt-strength of at least 2.5 g, determined by the haul-off method,] comprising the steps of

- subjecting propylene and optionally other olefins to polymerization in a plurality of polymerization reactors connected in series wherein said reactors are selected from the group consisting of loop reactors and gas phase reactors and wherein said reactors comprise at least one loop reactor and at least one gas phase reactor,
- employing different amounts of hydrogen as a molar mass modifier in at least two of the reactors, and
- carrying out the polymerization reaction in the presence of a catalyst system [capable of catalyzing] which catalyzes the formation of a high molar mass polymerization product having a MFR<sub>2</sub> of less than 0.1 g/10 min and a low or medium molar mass polymerization product having a MFR<sub>2</sub> of more than 0.5 g/10 min.

9. (Amended) The process according to claim 8, wherein the polymerization reaction is carried out in the presence of a catalyst system, [which is capable of catalyzing] which catalyzes the formation of a high molar mass polymerization product having an MFR2 of less than 0.04g/10 min and a low or medium molar mass polymerization product having a MFR2 of more than 0.5g/10min.

10. (Amended) The process according to any one of claim 8 or 9, wherein the catalyst [is capable of catalyzing] which catalyzes the formation of said high molar mass product and said low or medium molar mass product at a pressure of 25 to 80 bar and at a temperature of 60 to 100°C in a loop reactor.

15. (Amended) The process according to claim 14, wherein the metallocene compound in the metallocene catalyst is bridged bis(2-R-4-R'-indenyl)M Cl<sub>2</sub>, wherein both R and R' are aliphatic, cycloaliphatic or aromatic hydrocarbons having 1 to 18 C atoms, R' is typically phenyl or naphthyl, and R is a lower alkyl, M is a transition metal, and R and R' may contain heteroatoms[, such as silicon, nitrogen, phosphorous or germanium], and the bridge between the indenyls comprises 1 to 3 atoms[, such as carbon, silicon, nitrogen, phosphorous or germanium].

27. (Twice Amended) The process according to claim 25, wherein an overhead stream obtained from the evaporation [evaporation] of volatile components is condensed, a concentrated fraction of propylene being recovered from the condensed stream and recirculated to the reactor.

31. (Amended) The process according to claim 28, wherein [the] an overhead stream or part of it is recirculated to the second reactor.

32. (Amended) The process according to [any one of claims 21 to 28] 8, wherein the second polymerization product is fed into a third reactor and propylene is subjected to a third polymerization reaction to produce a third polymerization product.

33. (Amended) The process according to claim [30] 32, wherein the third polymerization reaction is carried out in a gas phase reactor in the presence of comonomers which give the third polymerization product properties of improved impact strength.

39. (Twice Amended) The process according to claim 8, wherein the catalyst system has been prepared by

- providing a procatalyst by reacting a magnesium halide compound, selected from the group consisting of magnesium chloride, a complex of magnesium chloride with ethanol and other derivatives of magnesium chloride, with titanium tetrachloride and an internal donor,
- providing as a cocatalyst an organoaluminum compound selected from the group consisting of trialkyl aluminum, dialkyl aluminum and alkyl aluminum sesquichloride
- providing an external donor having the general formula  $R'2(MeO)2Si$ , wherein  $R'$  stands for a cyclic or branched aliphatic, or aromatic group[, for example dicyclopentyl dimethoxysilane or di-t-butyl dimethoxysilane], and, optionally,
- prepolymerizing a small amount of olefin by contacting the olefin with said procatalyst, cocatalyst and the external donor.

40. Amended) The process according to claim 39, wherein the catalyst system has been transesterified with a phthalic acid ester - a lower alcohol pair, which transesterifies the catalyst at a [temparature] temperature of 110 to 150°C.